

REMARKS

By this amendment, claims 37, 38, 40, 41 and 43 have been cancelled without prejudice or disclaimer and claims 36, 39 and 42 amended to more particularly define the invention and clearly distinguish over the prior art of records. Claims 1-35 have been previously cancelled. Accordingly, claims 36, 39, 42, 44 and 45 are pending in the application, of which claim 36 is independent. Applicant respectfully submits that the above amendments do not add new matter to the application and are fully supported by the specification.

Entry of this Amendment is respectfully requested because it places the present application in condition for allowance, or in the alternative, better form for appeal. In view of the above Amendments and the following Remarks, Applicant respectfully requests reconsideration and withdrawal of the objections and rejections for the reasons discussed below.

Rejection of Claims under 35 U.S.C. §103

Claims 36-45 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U. S. Patent No. 5,259,881 issued to Edwards, et al. ("Edwards") in view of U. S. Patent No. 5,641,974 issued to den Boer, et al. ("den Boer") and further in view of U. S. Patent No. 5,578,520 issued to Zhang, et al. ("Zhang"). Applicant respectfully traverses this rejection for at least the following reasons.

In this response, claims 37, 38, 40, 41 and 43 are cancelled and independent claim 36 is amended to incorporate the limitations of the cancelled claims. Amended independent claim 36 recites:

“36. An apparatus for manufacturing a liquid crystal device, comprising:
a loading chamber receiving a substrate;
a preheat chamber receiving the substrate from the first chamber and preheating the substrate;
a chemical vapor deposition (CVD) chamber receiving the substrate from the preheat chamber and forming a gate insulating layer, an amorphous silicon layer and a doped amorphous silicon layer on the substrate; and
a sputtering chamber receiving the substrate from the CVD chamber and forming a metal layer on the doped amorphous silicon layer,
wherein the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber are *connected in series*, and the apparatus sequentially forms the gate insulating layer, the amorphous silicon layer, the doped amorphous silicon layer and the metal layer without breaking a vacuum and without patterning the gate insulating layer, the amorphous silicon layer, the doped amorphous silicon layer and the metal layer.”

According to claim 36, (a) the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber are connected in series, and (b) each of the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber performs a very specific process/processes.

For example, (a) the preheat chamber is arranged between the loading chamber and CVD chamber, and *specifically* performs preheating of the substrate, (b) the CVD chamber is arranged between the preheat chamber and the sputtering chamber and *specifically* performs forming of a gate insulating layer, an amorphous silicon layer and

a doped amorphous silicon layer, and (c) the sputtering chamber *specifically* performs forming of a metal layer on the doped amorphous silicon layer.

In this regard, Edwards discloses a wafer processing cluster tool, in which the thermal processing module, the sputter modules, the CVD module and the etch module are arranged around the common transfer chamber 18. Thus, Edwards fails to disclose “the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber are connected in series”. Also, Edwards fails to disclose or suggest each of the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber performing the very specific process/processes, as claimed.

The secondary reference to der Boer is directed to an LCD structure, which may be used to guess what kinds of processing steps are involved. However, the structure shown in der Boer does not necessitate an apparatus meeting “the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber are connected in series”, as claimed. Thus, der Boer would not be able to disclose or suggest each of the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber performs the very specific process/processes, as claimed.

Also, as shown in Fig. 10 of der Boer, the semiconductor layer 23 and the doped contact layer 25 are etched before the source-drain metal layer (29, 31) is formed. Thus, der Boer fails to disclose or suggest “the amorphous silicon layer, the doped amorphous silicon layer and the metal layer ... without patterning the gate insulating layer, the amorphous silicon layer, the doped amorphous silicon layer and the metal layer”, as claimed.

Another secondary reference to Zhang shows, in Fig. 2, a chamber 1 for feeding specimen, a plasma CVD chamber 2, an annealing chamber 3, a laser crystallization chamber 4 and a chamber 5 for discharging specimen in series. However, the series of chambers do not include the claimed preheat chamber and sputtering chamber, and the order of the chambers is substantially different from the orders of chambers recited in claim 36. Thus, Zhang fails to disclose "the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber are connected in series" and would not be able to disclose or suggest each of the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber performs a very specific process/processes, as claimed.

Since none of the cited references discloses or suggest these claimed features, it is submitted that claim 36 is patentable over them. Claims 39, 42, 44 and 45 are dependent from claim 36 and hence would also be patentable at least for the same reason. Accordingly, Applicant respectfully requests withdrawal of the 35 U.S.C. §103(a) rejection of claims 36, 39, 42, 44 and 45.

Claims 36-45 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U. S. Patent No.5,512,320 issued to Turner, et al. ("Turner") in view of den Boer and Zhang.

As mentioned above, according to amended claim 36, (a) the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber are connected in series, and (b) each of the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber performs the very specific process/processes.

For example, the preheat chamber is arranged between the loading chamber and CVD chamber, and specifically performs preheating of the substrate, (b) the CVD chamber is arranged between the preheat chamber and the sputtering chamber and specifically performs forming of a gate insulating layer, an amorphous silicon layer and a doped amorphous silicon layer, and (c) the sputtering chamber specifically performs forming of a metal layer on the doped amorphous silicon layer.

In this regard, Turner discloses a vacuum processing apparatus, in which a heating chamber and CVD chambers are arranged around a robot 22. Thus, Turner fails to disclose "the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber are connected in series". Also, Turner fails to disclose or suggest each of the loading chamber, the preheat chamber, the CVD chamber and the sputtering chamber performing the very specific process/processes as claimed.

As mentioned above, den Boer and Zhang fails to disclose or suggest these claimed features. Thus, it is submitted that claim 36 is patentable over the cited references. Claims 39, 42, 44 and 45 are dependent from claim 36 and hence would also be patentable at least for the same reason. Accordingly, Applicant respectfully requests withdrawal of the 35 U.S.C. §103(a) rejection of claims 36, 39, 42, 44 and 45.

Other Matters

In addition to the amendments mentioned above, claims 39 and 42 have been amended to be consistent with the amendments made to claim 36. These amendments are not made for the purpose of avoiding prior art or narrowing the claimed invention,

and no change in claim scope is intended. Therefore, Applicant does not intend to relinquish any subject matter by these amendments.

Conclusion

Applicant believes that a full and complete response has been made to the Office Action and respectfully submits that all of the stated objections and grounds for rejection have been overcome or rendered moot. Accordingly, Applicant respectfully submits that all pending claims are allowable and that the application is in condition for allowance.

Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact the Applicant's undersigned representative at the number below to expedite prosecution.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully Submitted,



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